

What is claimed is:

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1. A method of making a transgenic fusion protein comprising providing a transgenic animal which includes a transgene which provides for the expression of the fusion protein; allowing the transgene to be expressed; and, recovering the fusion protein, from the milk of the transgenic animal.

2. The method of claim 1, wherein the fusion protein includes an immunoglobulin-subunit and an enzyme.

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3. The method of claim 1, wherein the fusion protein includes a first member fused to a second member and the first member includes the subunit of a targeting molecule and the second member encodes a cell toxin.

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4. The method of claim 1, wherein the fusion protein includes a subunit of an Ig specific for a tumor antigen .

5. The method of claim 4, wherein the tumor antigen is from the group carcinoembryonic antigen (CEA), a transferring receptor, TAG-72, an epidermal growth factor receptor.

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6. The method of claim 1, wherein the fusion protein includes an Rnase.

7. The method of claim 6, wherein the RNase is RnaseA.

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~~8. The method of claim 1, wherein the fusion protein includes angiogenin.~~

9. The method of claim 1, wherein the fusion protein includes carboxypeptidase B enzyme.

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10. The method of claim 1, wherein the fusion protein is made in a mammary gland of the transgenic mammal.
11. The method of claim 1, wherein the fusion protein is secreted into the milk of a transgenic mammal at concentrations of at least about 0.5 mg/ml or higher.
12. The method of claim 1, wherein the fusion protein is secreted into the milk of a transgenic mammal at concentrations of at least about 1.0 mg/ml or higher.
13. The method of claim 1, the immunoglobulin subunit of a fusion protein is a humanized antibody.
14. The method of claim 1, wherein the transgene encoding the transgenic fusion protein is a nucleic acid construct which includes:
- (a) optionally, an insulator sequence;
 - (b) a mammary epithelial specific promoter;
 - (c) a nucleotide sequence which encodes a signal sequence which can direct the secretion of the fusion protein, e.g. a signal from a milk specific protein;
 - (d) optionally, a nucleotide sequence which encodes a sufficient portion of the amino terminal coding region of a secreted protein, e.g. a protein secreted into milk, to allow secretion, e.g., in the milk of a transgenic mammal, of the fusion protein;
 - (e) one or more nucleotide sequences which encode the fusion protein; and
 - (f) optionally, a 3' untranslated region from a mammalian gene.
15. An isolated nucleic acid construct, which includes:
- (a) optionally, an insulator sequence;
 - (b) a mammary epithelial specific promoter;
 - (c) a nucleotide sequence which encodes a signal sequence which can direct the secretion of the fusion protein, e.g. a signal sequence from a milk specific protein;

(d) optionally, a nucleotide sequence which encodes a sufficient portion of the amino terminal coding region of a secreted protein, e.g. a protein secreted into milk, to allow secretion, e.g., in the milk of a transgenic mammal, of fusion protein;

(e) one or more nucleotide sequences which encode a fusion protein as described in
5 claim 1; and

(f) optionally, a 3' untranslated region from a mammalian gene, e.g., a mammary epithelial specific gene, (e.g., a milk protein gene).

In another aspect, the invention features, a pharmaceutical or nutraceutical composition having an effective amount of fusion protein, e.g., an immunoglobulin-enzyme
10 fusion protein as described herein, and a pharmaceutically acceptable carrier.

In a preferred embodiment, the composition includes milk.

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rule 100 16
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101 human
15 A transgenic animal which includes a transgene that encodes a fusion protein
15 described in claim.

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16. The transgenic animal of claim 15, which can secrete the fusion protein into its
milk at concentrations of at least about 0.5 mg/ml or higher.

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